DOCUMENT RESUME

ED 297 028 TM 012 007

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TITLE Measuring Psychological and Physical Abuse of Children with the Conflict Tactics Scales.
INSTITUTION New Hampshire Univ., Durham. Family Research Lab.
SPONS AGENCY Northwest Regional Educational Lab., Portland, Oreg.
PUB DATE Feb 88
GRANT R01-MH40027; T32-MH15161
NOTE 28p.; For a related document, see TM 012 009.
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Child Abuse; Concurrent Validity; *Conflict; Family Problems; Family Violence; Parent Child Relationship; *Rating Scales; Test Reliability; *Test Validity
IDENTIFIERS *Conflict Tactics Scales; Physical Abuse; Psychological Abuse

ABSTRACT

Application of the Conflict Tactics Scales (CTS) to the assessment of child abuse is described. The CTS is a brief instrument designed to measure three aspects of parent-to-child behavior: (1) reasoning; (2) psychological aggression; and (3) physical aggression. The psychological and physical aggression indexes are intended to measure the incidence rate and severity of emotional and physical maltreatment of a child. The scales consist of lists of responses by parents to problems they have with their children. The lists are organized around the principle that acts are the primary indicator of child maltreatment. The physical abuse index measures overall violence, physical abuse, very severe violence, severe violence, and minor violence. Six items are included in the CTS to measure psychological aggression. Although extensive data illustrate the construct validity of the CTS, it appears that the internal consistency reliability is minimal and that concurrent validity studies are needed. The CTS measures are moderately reliable and are not confounded with social desirability response sets. Alternative child abuse measures (officially reported cases, national incidence studies, prediction instruments, and medical diagnosis) are considered. A copy of the CTS is appended. (TJH)

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Measuring Psychological and Physical Abuse of Children With the Conflict Tactics Scales*

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MEASURING PSYCHOLOGICAL AND PHYSICAL ABUSE OF CHILDREN WITH THE CONFLICT TACTICS SCALES*

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* This research is a project of the Family Violence Research Program of the Family Research Laboratory, University of New Hampshire, Durham, NH 03824. A program description and publications list will be sent on request. I am indebted to David Finkelhor, David Moore, Christine Smith and Barbara Wauchope for valuable comments and suggestions; to Dianne Cyr Carmody and Barbara A. Wauchope for locating research using the CTS, and to Christine Smith for the statistical analysis. The data are from the National Family Violence Resurvey, funded by National Institute of Mental Health grant R01MH40027 (Richard J. Gelles and Murray A. Straus, co-investigators). The Family Violence Research Program has also been supported by Graduate School of the University of New Hampshire, by a grant for "Family Violence Research Training from the National Institute of Mental Health (grant T32 MH15161), and by grants from a number of other organizations.

Since the development of the Conflict Tactics Scales (CTS) in the early 1970's, it has been used in two national surveys (Straus, Gelles, and Steinmetz, 1980; Gelles and Straus, 1988; Straus and Gelles, 1986, 1988) and in more than 40 studies of spouse abuse by other investigators (see summary in Straus and Gelles, 1988). On the other hand, except for studies by persons associated with the Family Research Laboratory (where the CTS was developed), it has been used in only six studies of child abuse (Brutz and Ingoldsby, 1984; Dembo et al, 1987; Eblen, 1987; Gelles and Edfeldt, 1986; Giles-Sims, 1985; Meredith, Abbott, and Adams, 1986). Despite this, studies using the CTS have made important contributions to knowledge of child abuse including unique information on the incidence of physical abuse (Gelles, 1978, Straus, 1983, Straus, Gelles and Steinmetz, 1980; Straus and Gelles, 1988), on risk factors associated with child abuse (Eblen, 1987; Straus, 1979b and Straus and Kaufman Kantor, 1987), on the effects of physical abuse on the child (Hotaling, Straus, and Lincoln 1988; Gelles and Straus, 1987), and on change over time in the incidence of physical abuse
(Straus and Gelles, 1986).

Part of the reason for relatively infrequent use of the CTS in child abuse research (as compared to extensive use in research on spouse abuse) may be inadequate documentation of the theoretical basis, psychometric characteristics, and procedures for using the CTS to measure child abuse. This is in contrast to the extensive documentation of the CTS as a measure of spouse abuse.*[1] This paper is intended to provide such information. However, to keep the paper to a reasonable length, readers will be referred to other papers which, while not focused on the CTS as a measure of child abuse, present information that is relevant.

DESCRIPTION AND THEORETICAL RATIONAL OF THE CTS

Description Of The Instrument

The CTS is a brief instrument designed to measure three aspects of parent-to-child behavior: Reasoning, Psychological Aggression, and Physical Aggression. The Psychological Aggression and Physical Aggression indexes are intended to measure the incidence rate and the severity of emotional and physical maltreatment of a child.*[2]

The CTS begins with the statement "Parents and children use many different ways of trying to settle differences between them. I'm going to read a list of some things that you and ...(name of child)... might have done when you had a problem with this child. I would like you to tell me how often you did it with...(him/her)...in the last year.

The list begins with the items from the Reasoning scale, such as "Discussed an issue calmly;" goes on to the items in the Psychological Aggression or emotional abuse scale, such as "Insulted or swore at him/her;" and ends with the Physical Aggression or "violence" items, such as "Slapped or spanked him/her" or "Kicked, bit, or hit with fist."

There have been three versions of the CTS. The differences are described elsewhere (Straus, 1988). Since there is rarely a need to use previous versions, this paper will refer entirely to the most recent version (Form R), which is reproduced as Appendix 1. Although Form R was administered as part of a survey conducted by phone, with minor alterations it can be administered as a questionnaire or in face-to-face interviews.

Theoretical Rational

Since the general theoretical basis of the CTS is presented in detail in two other publications (Straus, 1979a, 1988), this section is limited to a conceptual issue which is particularly important for research on child abuse: whether the referent for the term "abuse" is an injured child or acts by a caretaker.

The most frequently used conceptualizations of child abuse make injury to the child central. For example, the National Committee For the Prevention of Child Abuse (1985) defines physical abuse as "non-accidental injury" (italics added). The CTS, by contrast, makes the acts of the caretaker central to "abuse." It therefore measures the occurrence of these acts rather than injuries to the child. The specific behaviors measured are conceptualized as acts of "maltreatment" or "assault." Two types of maltreatment are covered: physical assaults and psychological assaults.

An assault is defined as an act carried out with the intention of causing pain or injury to another person. The pain or injury can be physical or psychological, and can range from mild to severe. An example of minor pain is the sting felt when a parent slaps a child's hand or the guilt or shame felt when a parent reprimands a child. More severe or persistent assaults carry a greater risk of injury, such as fractures and internal injuries, or impaired self-esteem, as when a parent continually denigrates a child.

Parents are legally and morally empowered to inflict physical and psychological pain on a child. The severity of the acts and the pain which is permissible to inflict varies tremendously between societies and between historical eras (Korbin, 1987; Radbill, 1987), and between groups within a society (Gelles and Straus, 1979; Giovannoni and Becerra, 1979). At some point, however, different societies and different groups draw a line. Child abuse consists of acts which go beyond that line, regardless of whether injury resulted. This is analogous to the moral and legal principle which holds that if an adult has sex with a child, that child has been sexually abused even though there may be no physical or psychological injury. There are several reasons why it is important to measure assaultive acts separately from injuries.

Consistent With Legal Usage. The first reason for using acts rather than injuries is consistent with the legal definition of assault. As Marcus (1983) puts it: "Physical contact is not an element of the crime...;" or as the Uniform Crime Reports puts it: "Attempts are included [in the tabulation of aggravated assault] because it is not necessary that an injury result..." (U.S. Department of Justice, FBI, 1985:21). However, many (or most) family violence researchers mistakenly believe that the legal criterion is injury.

Injury And Assault Loosely Linked. A second reason for making acts the primary indicator of child maltreatment is that the connection between assaults and injury is far from direct. In most instances, a child who is kicked or thrown against a wall will not be injured, whereas a child who is "only" slapped might fall and hit his or her head on an object and be seriously injured. This chance aspect of injury may be one of the reasons why the legal definition of assault is based on the act carried out, rather than whether an injury was produced.

More Realistic Estimate Of Incidence. For the reasons given above, most assaults, even severe assaults, do not result in an injury which needs medical attention. For example, more than 95% of confirmed cases of physical abuse are children who are being seriously assaulted, but who nonetheless do not require medical care for the physical injuries (Garbarino, 1986). Thus statistics based on injury underestimate the extent of child abuse by a huge amount. Consequently, estimates of the need for treatment and prevention programs which are based on using injury as the criterion will fail to include most parents who severely assault a child.

Makes Injury A More Researchable Issue. Measuring assaultive acts (both physical and psychological) separately from injuries makes it possible to investigate the extent to which injury does occur and the circumstances under which injury results.

Ignores Psychological Consequences of Physical Abuse. Another reason for using acts to measure physical abuse is that some of the most serious consequences of physical abuse are likely to be psychological, and therefore not easily observed. For children this can include low self-esteem, aggressiveness, and delinquency (Hotaling, Straus and Lincoln, 1988). In a typical investigation, it is possible to include measures of only a few of the possible psychological injuries, thus underestimating the extent of psychological injury resulting from physical abuse.

Reflects Humane Values. A final reason for focusing on acts, despite the great importance of injuries is a moral or humane values criterion. It should not be necessary for a child to be injured to classify behavior as abusive. From the perspective of this value orientation, punching or kicking a child is inherently wrong, even though no injury occurs.

Despite these arguments, for certain purposes, such as estimating the need for medical services by abused children, data on injuries is the most appropriate measure. In addition, it is important to recognize that the use of assaultive acts rather than injuries as the criterion for measuring violence poses a serious problem when communicating research results to the public. The public tends to think of child abuse as indicating an injured child. Researchers who use the CTS with a view to providing information relevant for public policy formation need to keep this problem mind to avoid serious misunderstandings.

THE CTS PHYSICAL AND PSYCHOLOGICAL ABUSE INDEXES

For purposes of this paper, the term "index" is a general term which refers to a variable created by combining two or more of the "items" ("indicators") in the CTS. The index can be in the form of a scale, a rate, or a typology. The difference between the CTS scales and CTS rates is that the scales are continuous variables and the rates are binary variables, coded 0 versus 1. Thus an analysis of variance using the scale version of the Severe Violence index will give the mean number of assaults on children which occurred during the year. If the same ANOVA is repeated with the rate version of the Severe Violence index, the results will show the proportion of parents (which can be converted to a rate per 1,000 parents by moving the decimal) who reported one or more severe assaults during the year.

Physical Abuse Measures

Overall Violence Index. The CTS includes nine items describing acts of physical violence: items K to S in Form R (see Appendix). Although these can be combined to create an overall measure, indicating whether a parent used any violence, the resulting measure is not usually very useful because in combines normatively permissible acts of violence (slapping and spanking) with acts which are not permissible and highly dangerous (kicking, burning, attacks with weapons, etc.) To deal with this problem, four more refined indexes have been developed.

Physical Abuse. The concept of "abuse" is a source of considerable difficulty and confusion because there is no consensus on the severity of violence required for an act to be considered "abuse." Despite this, "abuse" will be used for two reasons. First, it is less awkward than terms such as "Very Severe Violence Index." Second, abuse is such a widely used term that avoiding it creates communication difficulties.

As suggested above, what constitutes abuse is primarily a matter of social norms and administrative practice. Spanking or slapping a child, or even hitting a child with an object such as stick, hair brush, or belt, is not "abuse" according to either the legal or informal norms of American society, although it is in Sweden and several other countries (Haeuser, 1985). The CTS operationalization of child abuse attempts to take such normative factors into consideration by giving users the choice among two measures, each of which draws the line between physical punishment and physical abuse at a different point. Each consist of acts that have a relatively high probability of causing an injury. Thus, kicking is classified as very severe violence because kicking a child has a much greater potential for producing an injury than an act of "minor violence" such as spanking or slapping.

Very Severe Violence. This measure is the use by a parent of any CTS items N, P, Q, R or S (see Appendix), each of which are almost universally regarded as indicators of "abuse:" Kicked/bit/hit with fist, Beat up, Burned or scalded (Form R only), Threatened with a knife or gun, and Used gun or knife. The Very Severe Violence index is probably the most useful for administrative purposes because it is assumed to be the closest approximation of the type of behavior which is regarded as physical abuse by the Child Protective Service agencies of each of the states.*3

Severe Violence. Although the Very Severe Violence index may be the most suitable measure for purposes of estimating the rate or number of children in need of official intervention, it underestimates the rate and number of children who are being severely assaulted because it excludes CTS item O "hit or tried to hit with something." The "something" is usually a traditionally sanctioned object such as a hair brush or belt, and this is the reason it was omitted from the Very Severe Violence Index. However, if the object of an attack with a hair brush or belt were another adult, it would be considered a serious assault, and one can argue that the same standard should apply to children. The Severe Violence index does just that. The rate of physically abused children, when measured by the Severe Violence Index, is almost five times greater than when the Very severe Violence Index is used (see normative tables in Appendix 2).

The Minor Violence Index As A Measure of Physical Punishment. The Minor Violence index combines items K, L, and M of Forms N and R (threw things at the child, pushed grabbed or shoved, slapped or spanked).*4 It can be used as a measure of "physical punishment." However, the ambiguity of the concept of physical punishment needs to be kept in mind. The are no standard legally recognized criteria for physical punishment, nor even a requirement that the child not be physically injured (see Ingram v. Wright as described in Piele, 1979). In addition, as is generally the case with the CTS violence items, we do not know the intensity of each of the acts. Despite these shortcomings, the research cited in the opening paragraph shows the utility of the CTS as a measure of physical punishment.

A difficulty with the Minor Violence index is that, since most persons who have committed severe assaults also engaged in minor violence, this measure mixes parents who have committed only minor violence with those who have also severely assaulted.*5 One solution is to create a typology or nominal variable to identify the "level" of violence, as explained below in the section on violence types.

Severity Weighted Parent Violence Scale. This scale takes into account both the frequency and the severity of assaults on children by their parents. Severity (in the sense of injury producing potential) is indicated by a weight of from one to eight for items K through S. The scale is computed by multiplying the weight for each item by the frequency with which it occurred, and summing the products.*6 This procedure assigns a much higher score to children who are attacked with a weapon than to those who are slapped or spanked, and at the same time allows for the fact that very frequent slapping or spanking is abusive. Since the Severity Weighted Scale is a continuous variable, it is difficult to know where to set the cutting point for a level of violence that should be considered as abusive. There is an obvious need for research on this issue.

Although the Severity Weighted Scale results in a continuous variable, it has the same problems with extreme skewness as the other violence scales. The skewness problem may actually be worsened because the severity weighting creates even more extreme outliers than occur when only the items are weighted only by their frequency of occurrence. Consequently, as with the frequency weighted scales, the severity weighted index should not be used with statistical techniques (such as ordinary least square regression) which assume at least a moderately normal distribution. Instead, the scores can be used to divide the sample into nominal categories, or non-parametric regression techniques such as TOBIT can be used.

Ever Rates And Scales

Rates. Each CTS item in Forms N and R is followed by a question for each item which asks whether that act had ever occurred. This supplemental question is asked only for those who indicated that the act did not occur during the one year referent period. A lifetime prevalence rate can be computed by combining the main item and the "ever" question so that children who were assaulted either during the referent year of the survey (the main item) or at some previous time are coded as 1 and all other children are coded as zero. However, the rate estimated on the basis of this variable must be used with considerable caution because recall errors are almost certain to be large.

Scale. It is also possible to create a continuous scale, starting with 0 for no violence ever, 1 for no violence in the referent year of the study but violence occurred at some point prior to that, and then scores of 2, 3, 4 etc. for varying amounts of violence during the referent year. However, as noted in the earlier section on rates, the distribution of violence is skewed so extremely that misleading statistical results are likely. Consequently, if an "ever" scale is computed, it is probably best to recode it into a trichotomy by recoding 2 and over as 2, or to recode into a four category nominal scale.

Violence Level Types

If, as may sometimes be the case, the objective is to identify parents who used only minor violence, a typology rather than an index must be constructed. This is necessary because most parents who severely assault also engage in minor violence. One method is to create a three category typology: the non-violent, those who used only minor violence, and those who severely assaulted.*7

Psychological Abuse Measures

There are six items in the CTS intended to measure psychological aggression by parents. These are items D. Insulted, swore at, E. Sulked or refused to talk, F. Stomped out of the room or yard, H. Did or said something to spite the child, I. Threatened to hit or throw something at the child, and J. Threw, smashed, hit, or kicked something (item g is omitted).*8

Rates Versus Scales

Rates. An annual incidence rate more easily understood by the general public. In addition, since incidence rates are so frequently used in epidemiology and criminology, expressing child abuse as incidence rates permits comparisons with other related phenomena. For this reason almost all the statistics in Straus, Gelles, and Steinmetz (1980) are in the form of rates.

Continuous scales area usually an advantage in statistical analysis. However, in the case of the CTS abuse measures, the opposite is more often the case, i.e. there are certain statistical advantages to using rates rather than scales. This is because the distribution of the violence scores is extremely skewed (89 versus 11 percent for severe parent-to-child violence). This causes problems when violence is used as the dependent variable and this problem becomes even worse if the measure is in the form of a scale which indicates how much violence occurs, i.e. if the violent 11% tail of the distribution is extended by weighting those cases according to how often the violence occurred. Regression estimates can be seriously distorted by such a skewed distribution. Ironically, the situation is improved slightly if the score is transformed into a rate by dichotomizing into 1 = any severe violence, versus 0 = no violence.

Scales. Although rates are better than scales for most analyses using the CTS violence indexes, because (as explained above) a rate does not exacerbate the skewness problem, and also because rates are a statistic that more people can understand, there are circumstances where the scale scores are preferable. For example, the scale score rather than the rate is appropriate if the analysis focuses on a group, all of whom are known to have assaulted a child. For this population, the issue is not whether there was violence, but its frequency and severity. The "how much" issue is also relevant to analyses of violent groups identified by the CTS itself, as illustrated in the latter part of Wauchope and Straus (1988), where the issue was how often abusing parents assaulted the child.

RELIABILITY AND VALIDITY

Reliability

Alpha coefficients of reliability were computed for the responses of parents in the 1975 and 1985 National Family Violence Surveys (N = 1,135 and 3,232, see Appendix 2). The Alpha coefficients for the Psychological Aggression Scale were .77 in 1975 and .62 in 1985. For the Severe Violence Scale, the coefficient was .49 in 1985. These are minimum size coefficients and suggest that parents are not consistently abusive.

Validity

Concurrent Validity. To the best of my knowledge, there have been no studies which provide a formal test of concurrent validity. However, the concurrent validity of the CTS as a measure of spouse abuse has been demonstrated (Straus, 1979a, 1988) and since the same items are used for to measure child abuse, it is not unreasonable to hope similar results will be found when studies of the concurrent validity of the CTS measures of child abuse are conducted.

In the meantime, there are bits of indirect evidence of validity. First, contrary to concerns that a random sample of parents interviewed by a stranger would not divulge abusive behavior, the rates of abuse revealed by the CTS (reported in Straus and Gelles, 1988) are extremely high -- many times higher than the rate for abuse cases known to Child Protective Services. This is consistent with the long standing belief of case workers that there are many times more cases than are referred to them.

Another bit of evidence confirming the ability of the CTS to obtain data on violence is the consistency of the National Family Violence Survey Rates with the rate obtained by the Randomized Response Technique described earlier and which is widely assumed to be able to elicit more complete reporting of deviant behavior. Zdep and Rhodes (1976) used this technique, which guarantees the anonymity of the respondent, to estimate the incidence of child abuse. Their estimate of 15% is almost identical to the rate obtained that year by the National Family Violence Survey using the CTS.

A major threat to the validity of all self-report data is confounding with "social desirability response sets." It is almost certain that many parents who respond to the CTS questions do no reveal incidents which actually occurred. Since this is the case, differences in the abuse rate between groups of respondents, such as such as those with low and high education, may reflect a greater concern of one group to present themselves in a favorable light. Several studies investigated this possibility (Arias and Beach, 1987; Newberger and White, 1987; Saunders, 1986; Saunders and Hanusa, 1986). Surprisingly, all found weak or non-significant correlations of standard measures of social desirability response set measure and none found that a statistical control using the response-set scores affected the findings.[49]

It is important to reiterate that evidence showing the ability of the CTS to obtain information from parents on physical abuse, and the evidence showing that the CTS is not confounded with social desirability response set, does not invalidate the previous warning concerning under-reporting. It is almost certain that the CTS rate underestimates the true rate. It seems safe to assume that, even with the best designed instrument, not every parent will be willing or able to divulge such information. Consequently, even though the CTS rates of physical abuse are many times higher than the rate based on cases known to child protective services, the actual incidence rate is probably even higher.

Construct Validity. The construct validity of the CTS can be assessed by the degree to which the CTS measures produce findings which are consistent with theoretical or empirical propositions about the aspect of abuse which the instrument purports to measure. A number of studies using the CTS have been published which provide such evidence. For example:

* Almost all studies show that physical abuse occurs more frequently in poor families. However, part of the difference is probably due to the fact that the poor are more likely to be the object of intervention by welfare officials. The use of the CTS has helped resolve that issue because it shows that there are large socioeconomic class differences even when no official intervention is involved.

* There is a broad consensus that stress increases the risk of child abuse. The results of two studies using the CTS are consistent with that theory (Eblen, 1987; Straus and Kaufman Kantor, 1987).

* Studies using the CTS show that parents who were victims of violence as children have a higher rate of abuse toward their own children (Straus, 1983; Straus, Gelles and Steinmetz, 1980). These findings are consistent with many other empirical findings and social learning theory and has also been confirmed by many other investigators (see meta analysis by Hotaling and Sugarman, 1986).

* Gelles and Straus (1987, 1988) compared children who had been severely assaulted by a parent with non-assaulted children and found results consistent with the theory that physically abuse increase the risk of various social and psychological problems. Specifically, they found that abused children had 2 to 4 times higher rates of:

  Trouble making friends
  Temper tantrums
  Failing grades in school
  Disciplinary problems in school and at home
  Physically assaultive behavior at home and elsewhere
  Vandalism and theft
  Drinking and drug use
  Arrests

All of the above findings, since they are consistent with "strong" theories and previous empirical findings, contribute to confidence in the construct validity of the CTS.

ALTERNATIVE CHILD ABUSE MEASURES

Despite the evidence of construct validity just presented, there are grounds for caution because the internal consistency reliability is minimal and there have not yet been concurrent vaulted studies. In addition, the CTS has certain deficiencies as a measure of physical and psychological abuse of children (see below). Consequently, a decision concerning whether to use the CTS will depend on the alternatives. This section therefore reviews some of the other methods which have been used in research on physical abuse of children:

Officially Reported Cases. Annual statistics are compiled on the number of child abuse cases reported to the Child Protective Services under the mandatory reporting laws which are in effect in all the states (American Association for Protecting Children, 1986). These are the most widely known and widely accepted statistics on child abuse in the United States. However, it is widely acknowledged that there are many more abused children than are officially reported. Thus, the 1984 rate for physical abuse cases known to child protective services was estimated by Straus and Gelles (1988) to be 6.8 per thousand children. By contrast, the CTS rate using Very Severe Violence as the criterion is 23 per thousand, and 110 per thousand when using the Severe Violence measure. Thus the CTS rate for the more severe assaults on children is 3.4 times greater than the officially reported rate, and the CTS rate for the more inclusive measure of physical abuse is 16 times greater than the officially reported rate.

National Incidence Study. This study attempted to find out about all known cases of child abuse in a sample of 26 counties surveyed in 1980 (National Center on Child Abuse and Neglect, 1981). The procedure went beyond the official reporting system described above by also collecting data on cases known to personnel in community institutions (schools, hospitals, police, courts), irrespective of whether the cases had been officially reported. It produced a physical abuse rate of 3.4 percent children. This was about 26% higher than the rate of officially reported cases of physical abuse in 1980 (the CPS rate has gone up tremendously since then because the new attention to sexual abuse has produced an influx of cases), but is still much lower than the rate from the surveys using the CTS.

One way to interpret the differences between the rates produced by the CTS and those produced by the two methods just described is to say that comparison of these two rates with the rate obtained using the CTS in two national surveys shows that there are from several times more physically abused children in the United States than receive help. The same point can also be expressed in the terminology used by epidemiologist, i.e., the discrepancy between the Child Protective Services rate and the CTS rates of child abuse occurs because each measures a somewhat different phenomena. The rate obtained by counting the number of cases known to Child Protective Services and other human service professionals is more a measures of intervention or treatment than an incidence rates (see Straus and Gelles, 1986 for further explanation).

Prediction Instruments. There have been a number of instruments developed to identify parents who have a higher than normal risk of abusing their children. These instruments differ from each other in a number of ways which cannot be discussed here because of lack of space. For example, the Adult-Adolescent Parenting Inventory (ASPI) of Bavoleck (1984) emphasizes the overt behavior of the parent toward the child and includes sub-scales for use of physical punishment, inappropriate expectations, lack of empathy, and role reversal. The Child Abuse Potential Inventory (CAP) of Milner, 1986) on the other hand emphasizes the personality of the parent and includes sub-scales for Distress, Rigidity, Unhappiness, Problems with child and self, Problems with family,and Problems from others. Other instruments are reviewed in Schneider, Helfer, and Hoffmeister (1980).

Despite occasional use of terminology which some might suggest otherwise, these instrument do not measure the occurrence of acts of physical abuse. For example, Milner's CAP results in an overall measure called the "Abuse Scale." However, none of the items refer to physical abuse, nor should they. This is because the instrument is a tool for prevention work, and is intended to identify parents at risk of being abusive before abuse actually occurs.

There is a certain irony in the fact that these instruments were developed for use in programs designed to provide services which can aid high risk parents avoid having the risk becoming a reality. The irony is that these instruments are more appropriate for research than for prevention programs. The problem is not deficiencies in the instruments per se. The CAP, for example, exemplifies sound psychometric techniques, including validity studies presented with commendable clarity in the test manual. The problem is the high incidence of "false positives" inherent in predicting any phenomenon with a low incidence rate (Light, 1973). For example, Milner administered the CAP to abusing parents and to a comparison group. The discriminant analysis correctly classified 93% of parents. Assuming 93% accuracy and an incidence of clinically identifiable child abuse of 2%, application of the CAP to all parents in a community would correctly identify two out of every 100 children as being at high risk of abuse and incorrectly identify seven. Thus, 78% of the cases assessed would be falsely labelled (cf. Light 1973, p.571 for estimation procedures).

Medical Diagnosis. The paper of C. Henry Kempe et al (1962), which helped mobilize medical and public attention on child abuse described the use of medical diagnostic techniques to distinguish between children who are the victims of accidental injury and those who are the victims of inflicted injuries. Studies of children admitted to emergency departments of urban hospitals for accidental injury suggest that about 10% of such children are abuse victims. However, other studies (reviewed in Pless et al, 1987) have produced far lower figures. Regardless of which rate is correct, protocols for evaluating children admitted to emergency rooms (such as the SCAN Sheet described in Pless et al, 1987) are extremely important because they can identify children who are in the greatest need for protective services. Unfortunately, 26 years after Kempe's paper, only a minority of hospitals consistency uses such protocols.

On the other hand, even if all hospitals were to use a child abuse detection protocol, it would still leave undetected more than 95% of physically abused children. This is because, as noted in the discussion of why the CTS is based on assaults rather than injuries, less than five percent of child abuse cases known to Child Protective Services involve an injury that is serious enough to need medical attention. Most physically abused children (in contrasted to the cases which make front page headlines) involve repeated severe beatings, but not injuries. These are children and parents in dire need of assistance, but not medical assistance. Consequently, hospital based detection methods are not a substitute for an instrument such as the CTS. Instruments such as the CTS are essential for epidemiological surveys, for testing causal theories, and for program evaluation research.

REASONS FOR UNDER-UTILIZATION OF THE CTS IN CHILD ABUSE RESEARCH

An interesting issue in the sociology of science is why the CTS has been so widely used to measure spouse abuse and so rarely used to measure child abuse. The reasons can be grouped into two categories. One category consists of problems associated with the compartmentalization of research on child abuse and spouse abuse, each of which tends to be studied by a different group of scholars who are not familiar with research on other aspects of family violence (Finkelhor, 1983). These will be called "institutional impediments." The second category consists of shortcomings of the CTS as a means of measuring physical abuse of children.

Institutional Impediments

1. Differentiated Communication Channels. The 1979 article which has served as the "test manual" for this instrument does briefly describe the method of computing a measure of child abuse. However that article devotes more attention to use of the CTS in studying marital violence. For example, the appendix with a copy of the CTS uses the version focused on couples rather than parents. In addition, this article was published in a journal which is read by researchers interested in marriage and the family, rather than in a journal such as Child Development where it would more likely have come to the attention of child abuse researchers.

2. Alternative Data Available. Investigators concerned with child abuse have had alterative sources of data: the cases reported to Child Protective Services in each of the states under the mandatory child abuse reporting laws (American Association For Protecting Children, 1986), and the so-called "National Incidence Study" of child abuse (National Center On Child abuse and Neglect, 1981), whereas the CTS has been the only source of incidence rate data for spouse abuse. Moreover, much child abuse research has been conducted by persons connected with the service delivery system. Since the alternative statistics are generated by the child welfare service system, such persons may tend to pay more attention to cases identified by other child welfare professionals.

3. Measures Acts Rather Then Injuries. The legal mandate of Child Protective Services and other social welfare workers emphasizes injuries as the criterion for abuse. Since the original article on the CTS did not include a discussion of the relation between acts and injury-based measures, and the importance of using a measure based on acts, readers were not in a position to understand that, rather than being a disadvantage or\ limitation, the focus on acts rather than injuries is one of the main advantages of the CTS.

4. Requires A Decision About What Constitutes Child Abuse. The CTS acts range from spanking to attacks with weapons. It therefore forces the user of this instrument to draw a line between physical punishment and abuse, which is difficult and will be criticized no matter where the line is drawn. This problem is avoided (because it is left to case workers to interpret the often vague statutes) if the "official statistics" on child abuse are used. This problem does not occur in research on marital violence because there is wide consensus that any hitting is abuse.

Shortcomings Of The CTS For Measuring Child Abuse*10

The major shortcomings of the CTS are associated with the fact that it was originally designed with reference to the behavior of parents of children who are at least three years old.

1. Minor Acts Of Violence For A Six Year Old are Dangerous For A Six Month Old Child. Spanking or shoving a child of six is appropriately labeled as minor violence, but can be life threatening for an infant. The present procedures for classifying an act as abusive and scoring the child abuse scale do not take that into account.

2. A Different List Of Acts is Needed For Infants And Toddlers. Some of the acts at the severe end may be redundant, for example threatening an infant with a knife or gun. On the other hand, acts which are extremely dangerous to infants, such as shaking, are not part of the CTS list of violent acts.

3. Reasoning Items Not Appropriate. The versions of the CTS developed to date begin with Reasoning scale items that are not considered appropriate for infants and one-year-olds; specifically, the items in the Reasoning scale, such as "Discussed the problem calmly."

4. Age-Specific Norms Lacking. The table of norms published as part of the 1979 article on the CTS does not provide separate figures for children of different ages, yet this is a highly age-related phenomenon (Wauchope and Straus, 1987).

The problems just listed make it clear that modifications of the CTS are needed if the instrument is to be used to measure abuse of infants and toddlers. Each of the problems listed above can be dealt with by relatively straightforward modifications.*11

SUMMARY AND CONCLUSIONS

This paper describes and evaluates the Conflict Tactics Scales (CTS) as a measure of physical and psychological abuse of children. The CTS seems to be the only available instrument for measuring physical and emotional maltreatment of children, as compared to measuring the effects of the maltreatment in the form of a physically or psychologically injured child.

The CTS measures are moderately reliable and are not confounded with social desirability response sets. The concurrent validity of the CTS as a measure of child abuse has not yet been investigated. However, since there is strong evidence for the concurrent validity of the CTS for measuring spouse abuse, this may also apply to its use as a measure of physical abuse of children. The many findings which have resulted from research using the CTS in studies of physical abuse of children provide evidence of the construct validity of this instrument.

The CTS has not yet been used for research on psychological abuse of children. Consequently, no conclusions can be drawn about the validity of that scale. However, the validity of the corresponding measure of psychological abuse between marital partners, coupled with the lack of an alternative measure of emotional maltreatment, suggests that this instrument could be important for advancing knowledge of the incidence, antecedents, and consequences emotional maltreatment.

Although the CTS index of physical abuse has proven itself, and the CTS measure of psychological abuse is promising, both measures can also be regarded as basis for further development and refinement by methodologically inclined investigators. The CTS has deliberately not been copyrighted in order to encourage such developments as well as additional methodological research on the CTS as it now stands.

Parents and children use many different ways of trying to settle differences between them. I'm going to read a list of some things that you and...(CHILD) might have done <u>when you had a problem with this child</u>. I would like you to tell me how often you did it with (HIM/HER) in the past year (READ CATEGORIES)

	In Past Year 1 = Once 2 = Twice 3 = 3-5 Times 4 = 6-10 Times 5 = 11-20 Times 6 = More than 20 0 = Never	For items marked "Never" When you and (CHILD) had a disagreement: Have you Ever? 1 = Yes 0 = No
A. Discussed an issue calmly with...(CHILD)	1 2 3 4 5 6 0	1 0
B. Got information to back up your side of things	1 2 3 4 5 6 0	1 0
C. Brought in, or tried to bring in, someone to help settle things	1 2 3 4 5 6 0	1 0
D. Insulted or swore at him/her	1 2 3 4 5 6 0	1 0
E. Sulked or refused to talk about it	1 2 3 4 5 6 0	1 0
F. Stomped out of the room or hours or yard.	1 2 3 4 5 6 0	1 0
G. Cried	1 2 3 4 5 6 0	1 0
H. Did or said something to spite him/her	1 2 3 4 5 6 0	1 0
I. Threatened to hit or throw something at him/her	1 2 3 4 5 6 0	1 0
J. Threw or smashed or hit or kicked something	1 2 3 4 5 6 0	1 0
K. Threw something <u>at</u> him/her	1 2 3 4 5 6 0	1 0
L. Pushed, Grabbed, or shoved him/her	1 2 3 4 5 6 0	1 0
M. Slapped or spanked him/her	1 2 3 4 5 6 0	1 0
N. Kicked, bit, or hit with a fist	1 2 3 4 5 6 0	1 0
O. Hit or tried to hit with something	1 2 3 4 5 6 0	1 0
P. Beat him/her up	1 2 3 4 5 6 0	1 0
Q. Burned or scalded him/her	1 2 3 4 5 6 0	1 0
R. Threatened with a knife or gun	1 2 3 4 5 6 0	1 0
S. Used a knife or gun	1 2 3 4 5 6 0	1 0

Appendix 2: "NORMATIVE TABLES BY AGE OF CHILD AND GENDER OF PARENT

The norms presented in this appendix are based on a nationally representative sample of 3,232 American parents interviewed in 1985. The sample and other information on the study are presented in Gelles and Straus (1988), Straus and Gelles (1986), and Wauchope and Straus (1988).

Two Types of Normative Tables

The usual methods of presenting norms is not adequate for the CTS measure of physical abuse because the distribution is so highly skewed that variation within the violent group is obscured. To deal with this problem, two types of normative tables are given for physical abuse: a table of rates and tables of percentiles for the frequency of assaults within the sub-group who reported one or more assaults on a child

The violence rates in Table 1 are useful for comparing the subjects of a particular (for example, a community or occupational group) with the national rate. Table 1 is therefore primarily useful for epidemiological or sociological research.*13

The percentiles in Tables 2 and 3, on the other hand, are useful with a clinical sample. Since, by definition, every parent in such a sample is or is suspected of being abusive, the issue is how does the frequency or severity of the maltreatment by such a parent compare with the frequency and severity found in a national sample of parents.

Age-Specific Norms For Parent-To-Child Violence. Since there are large age variations in the Minor Violence index, norms based on children of all ages are not appropriate. Consequently, there are separate norms for acts by parents of children ages 0-2, 3-6, 7-10, 11-14, and 15-17.

(Tables 1, 2, and 3 about here)

Table 1. Annual Incidence Rates For Assaults Against Children, National Family Violence Survey, 1985*

Type of Intra-Family Violence[1]	Rate Per 1,000 Families As Reported by: Total	Fathers	Mothers
ANY assaults against 0-2 year olds	575	575	574
ANY assaults against 3-6 year olds	894	863	916
ANY assaults against 7-10 year olds	777	728	804
ANY assaults against 11-14 year olds	539	488	571
ANY assaults against 15-17 year olds	287	209	329
SEVERE assaults against 0-2 year olds	79	61	93
SEVERE assaults against 3-6 year olds	143	135	148
SEVERE assaults against 7-10 year olds	143	154	136
SEVERE assaults against 11-14 year olds	107	89	118
SEVERE assaults against 15-17 year olds	70	64	74
VERY SEVERE assaults against 0-2 year olds	22	6	34
VERY SEVERE assaults against 3-6 year olds	26	20	30
VERY SEVERE assaults against 7-10 year olds	24	20	26
VERY SEVERE assaults against 11-14 year olds	25	30	21
VERY SEVERE assaults against 15-17 year olds	21	34	14

*Rates are based on the 1985 sample of 3,232 households with a child age 17 and under. The N's for each age group are: 0-2 - 538, 3-6 - 680, 7-10 - 571, 11-14 - 622, 15-17 - 576. Note: The rates shown differ from those in Straus and Gelles (1986) because the rates in that paper were computed in a way which enabled the 1985 rates to be compared with the more restricted sample and more restricted version of the Conflict Tactics Scale used in the 1975 study.

Table 2. Centile Equivalents for Frequency of Parent-to-Child Conflict Tactics as Reported by Mothers, National Family Violence Resurvey, 1985

CENTILE	Age of Child																					CENTILE
	0 to 2 years					3 to 6 years					7 to 10 years					11 to 14 years					15 to 17 years					
	RS	VB	MV*	SV*	AB*	RS	VB*	MV*	SV*	AB*	RS	VB	MV*	SV*	AB*	RS	VB*	MV*	SV*	AB*	RS	VB	MV*	SV*	AB*	
1	1	1	1	1		1	1	1	1		1	1	1	1		1	1	1	1		1	1	1	1		1
5	1	1	1	1		4	1	1	1		2	1	1	1		2	1	1	1		2	1	1	1		5
10	5	2	1	1	1	4	2	2	2	1	4	1	1	1	1	3	2	1	1		3	1	1	1		10
15	3	2	2	1	2	6	2	4	4	1	5	2	2	2	1	4	2	1	1	1	4	2	1	1	1	15
20	4	2	3	2	2	8	3	4	4	1	8	3	2	2	1	6	3	2	2	1	5	2	1	1	1	20
25	4	2	4	2	2	9	4	4	4	1	8	4	2	2	2	8	4	2	2	1	6	3	1	1	1	25
30	5	3	4	2	2	12	4	4	4	2	9	4	3	4	2	8	4	2	2	1	8	4	1	1	1	30
35	6	4	4	4	2	16	5	4	5	2	10	5	4	4	2	9	4	3	3	1	8	4	1	2	2	35
40	8	4	4	4	2	20	7	6	8	2	12	6	4	4	2	12	5	4	4	1	10	5	2	2	3	40
45	8	4	8	4	2	25	8	8	8	2	16	7	4	4	2	15	6	4	4	2	12	6	2	2	3	45
50	12	7	8	4	2	25	9	8	8	2	19	8	4	5	3	17	8	4	4	2	13	6	2	2	4	50
55	16	8	8	4	4	26	10	8	12	2	23	9	5	6	4	20	8	4	4	2	16	8	2	4	4	55
60	25	11	12	6	5	27	14	12	15	2	25	9	6	8	4	25	9	4	5	2	19	8	3	4	4	60
65	25	15	15	8	5	29	16	15	17	3	26	12	8	8	4	25	12	5	6	2	25	10	4	4	4	65
70	25	20	16	13	7	31	20	16	23	4	29	14	8	9	4	27	13	6	8	2	26	12	4	4	6	70
75	27	23	25	15	15	33	25	19	25	4	33	17	8	13	4	30	16	8	8	2	29	13	4	5	7	75
80	29	25	25	25	17	40	26	25	25	4	34	20	12	16	5	33	18	8	10	3	31	16	5	6	8	80
85	33	27	25	25	23	41	30	25	27	10	40	27	16	21	5	35	25	8	15	4	33	22	6	8	8	85
90	40	30	25	25	25	50	33	26	32	15	50	33	23	25	13	42	32	15	20		40	28	8	17		90
95	50	50	29	40		50	40	29	51		50	46	29	37		50	42	19	32		50	35	16	27		95
99	75	63	46			65	59	50	104		75	67	47	73		61	75	33	85		65	57	33	73		99

RS = Reasoning, VB = Verbal Aggression, MV = Minor Assaults, SV = Severe Assaults, AB = Very Severe Assaults. The norms for Reasoning and Verbal aggression cover all cases. The norms for the three violence indexes are for cases in which at least one violence incident occurred. See text.

Table 3. Centile Equivalents for Frequency of Parent-to-Child Conflict Tactics as Reported by Fathers, National Family Violence Resurvey, 1985

CENTILE	Age of Child																					CENTILE
	0 to 2 years					3 to 6 years					7 to 10 years					11 to 14 years					15 to 17 years					
	RS	VB	MV*	SV*	AB*	RS	VB*	MV*	SV*	AB*	RS	VB	MV*	SV*	AB*	RS	VB*	MV*	SV*	AB*	RS	VB	MV*	SV*	AB*	
1	1		1			1	1	1			2	1	1	1		1	1	1	1		1	1				1
5	1	1	1			3	1	1	1		2	2	1	1		2	1	1	1		2	1	1	1		5
10	2	1	2	1		4	2	2	1		4	2	2	2		3	1	1	1		3	1	1	1		10
15	3	2	2	1		5	2	2	2	1	6	2	2	2		4	2	1	1	2	4	1	1	1	1	15
20	4	2	4	1		8	3	4	2	1	8	4	2	3	1	5	2	1	2	2	4	2	1	1	1	20
25	4	3	4	2		8	4	4	2	1	8	4	3	4	1	6	2	2	2	2	5	2	1	2	1	25
30	6	4	4	2		10	4	4	2	1	8	4	4	4	1	8	3	2	2	2	7	2	1	2	1	30
35	8	5	4	2		15	4	4	2	1	10	5	4	4	1	8	4	2	2	2	8	2	1	2	1	35
40	10	6	8	3	3	16	5	5	2	1	12	6	4	4	1	8	4	2	2	2	8	2	2	2	1	40
45	12	8	8	4	4	23	6	8	4	2	16	8	4	4	2	12	4	2	4	2	8	3	2	3	2	45
50	15	10	8	5	5	25	8	8	4	2	23	8	4	6	2	15	6	4	4	2	10	4	2	3	2	50
55	16	12	10	7	6	25	8	8	4	2	25	8	5	8	3	16	8	4	4	2	12	4	2	4	2	55
60	25	14	15	8	6	25	8	8	4	2	27	10	6	8	4	19	10	4	4	3	16	6	3	4	2	60
65	25	15	15	11		28	10	12	4	2	30	12	8	8	4	24	11	4	5	3	19	7	3	5	2	65
70	25	17	17	15		30	12	15	8	11	30	14	8	12	4	25	13	6	8	3	23	8	4	5	2	70
75	29	19	25	15		33	15	17	8	19	33	16	11	14	4	29	15	8	8	3	25	10	4	6	3	75
80	30	25	25	23		40	24	25	8	25	40	19	12	17	4	30	18	8	13	4	28	13	4	7	4	80
85	33	26	25	25		50	28	25	15	25	40	24	16	23		33	24	12	20	4	33	16	6	10	4	85
90	40	29	25	25		50	37	29	23		50	31	22	27		41	27	17	26		37	25	6	15		90
95	50	36	33			54	53	39	34		54	51	30	34		50	41	29	36		42	30	8	19		95
99	55		50			75	83	50		123	75	65	50	57		54	64	40	91		51	62				99

RS = Reasoning, VB = Verbal Aggression, MV = Minor Assaults, SV = Severe Assaults, AB = Very Severe Assaults. The norms for Reasoning and Verbal aggression cover all cases. The norms for the three violence indexes are for cases in which at least one violence incident occurred. See text.

1. This probably occurred because, at the time, the primary focus of my own research was on spouse abuse.

2. In order to conserve space and focus the article on topics of primary interest to readers of this journal, except for this note, little will be said about the Reasoning Index. The Reasoning index consists of the sum of items A, B, and C. These items were included in the CTS for two purposes. First, as explained elsewhere (Straus, 1979a), these items give parents an opportunity to say that they have used positive techniques in dealing with the child and hence make it easier to admit to negative techniques. Second, although three items are not enough for an adequate measure of this aspect of parent behavior, even this brief measure may be useful in some circumstances. Consequently, norms for the Reasoning scale are included in the appendix to this article, and a brief discussion of the limitations of this measure is included in the main text.

3. The SPSS commands to create the Very Severe Violence Scale (VSVS), and the Very Severe Violence Rate (VSVR) are given below. However, before computing these measures the response categories should be recoded from the 0 to 6 format to values indicating the midpoints of the frequency designated by each response category. Code values 0, 1 and 2 do not need to be recoded. The other values should be recoded as follows: 3=4 4=8, 5=15, and 6= 25). This makes the scale scores a measure of the number of assaults which occurred (for brevity, this will be identified as a "frequency weighted" scale).

```
COMPUTE         VSVS = ITEMN + ITEMP + ITEMQ + ITEMR + ITEMS
VAR LABELS      VSVS 'Very Severe Violence Scale'
```

The Very Severe Violence Rate or VSVR (see above for the way in which the term rate is used here) can be created with the following SPSS commands:

```
COMPUTE         VSVR = VSVS
VAR LABELS      VSVR 'Very Severe Violence Rate"
RECODE          VSVR  (1 THRU HI = 1)
```

4. Since the minor violence acts are items K, L, and M, the following SPSS commands can be used to compute this scale:

```
COMPUTE         MVS = ITEMK + ITEML + ITEMM
VAR LABELS      MVS  'Minor Violence Scale'
```

5. At first glance one might think that this problem can be avoided by a "conditional transformation," i.e. one which computes the minor violence index only if the scale on the severe violence index is zero. However, this is not satisfactory because it does not deal with the cases where there was both severe and minor violence. If they are scored as zero on minor violence, this is misleading in the extreme. If they are assigned the "missing value" code, then these critically important cases are lost from the analysis.

6. The weights used to compute the Severity Weighted Scale, which were chosen on the basis of consultation with colleagues concerning the injury producing potential of each act, are: Items K, L, and M (the minor violence acts) are unweighted, i.e. they have a weight of 1. The weights for the other items are: N. kick, bit, punch = 2; O. hit with object = 3; P. beat up and Q. burned, scalded = 5, R.threatened with a knife or gun = 6, S. used knife or gun = 8. The response categories for how often each act occurred must first be recoded from the codes of 0 through 6 as noted in the directions for computing the Very Severe Violence Index.

7. The following SPSS commands were used to classify the parents in the National Family Violence Resurvey. (In these commands, MVS = Minor Violence Scale, SVS = Severe Violence Scale, and VLT = Violence Level Types.)

```
IF          (MVS EQ 0 AND SVS EQ 0) VLT=0
IF          (MVS GE 1 AND SVS EQ 0) VLT=1
IF          (SVS GE 1) VLT=2
VAR LABELS  VLT 'PARENT VIOLENCE LEVEL'
```

In principle, one could add a category for those who used severe violence and no minor violence. However, there is little point to this because almost everyone who severely assaults also engages in minor violence. In addition, there is no obvious conceptual reason for identifying those few people who seriously assault, but do not also slap or shove.

8. To compute the Emotional Abuse Scale (EAS), first recode the items as explained in the scoring directions for the Severe Violence Scale. Then use the following SPSS commands:

```
COMPUTE         EAS = ITEMD + ITEME + ITEMF + ITEMH + ITEMI + ITEMJ
VA LABELS       EAS 'Emotional Abuse Index'
```

9. Also relevant to the example of socioeconomic status differences in child abuse is are the results of research on class differences in response sets and in self-disclosing type behavior. These studies almost always find that better educated and higher income persons are more self-disclosing and tend to have lower scores on social desirability response set measures (Chelune, 1978; Hardt and Peterson-Hardt, 1977; Hartshorn and May, 1928; Jourard and Richman, 1963; Kleck, 1982; Mensch and Kandel, 1987; Plasky and Lorion, 1984; Richardson, Dohrenwend, and Klein, 1965; Sudman and Bradburn, 1974).

10. Criticisms of the CTS as a measure of <u>spouse</u> abuse are summarized in another paper (Straus, 1988). That paper should be consulted before using the CTS because some of those criticism may also apply to <u>child</u> abuse, and because the article contains much other information on the CTS.

11. An example of a modification which makes allowance for the age of the child is a recent survey conducted for the New Hampshire Task Force on Prevention of Child Abuse by Moore and Straus (1987). Since children of all ages were included in the study, Moore and Straus dropped the reasoning items when the child was an infant or a one year old. Perhaps a better alternative would be to substitute age-appropriate items such as "Picked up the child and hugged him/her." This can be done by building in to the interview design "filters" or "branching" instructions directing the interviewer to ask one version of the questions if the child is a certain age and anther version if the child is another age. This is a standard and well proven practice in survey research.

12. The CTS is <u>not</u> copyrighted. Anyone may therefore use or modify it without permission. However, I would appreciate copies of any reports using the CTS so that the bibliography can be updated for the benefit of other scholars.

13. Previous reports on the 1975 study (and some reports on the 1985 study) expressed the violence rate as a <u>percentage</u> of husbands, wives, or children. However, in this paper and most others, we use rate per 1,000 couples or children. There are three reasons for this. (1) <u>Comparability With Other Crime and Child Abuse Rates</u>. The National Crime Survey (NCS), which has become the <u>de facto</u> standard for survey research on the incidence of crime and victimization, and the annual rates of child abuse cases reported to child protective services in the United States, both use rate per thousand. Adopting that standard facilitates comparison of rates from this survey with the rates for reported cases of child abuse, and with NCS rates for assault and other crime. Another alternative is the Uniform Crime Reports system of rates per 100,000. However, a rate per hundred thousand is not

appropriate since our survey samples were in the thousands, not hundred thousands. (2) Results are presented as integers. It is customary in demography, criminology, and medical sociology to use a rate which enables the data to be presented in integers. For example, the 1981 cancer death rate is given in the Vital Statistics as 184 per 100,000 population rather than 0.00184 per capita or 0.184% because most people find it easier to conceptualize integers. Thus, the difference between the cancer rate and the suicide rate is more easily perceived when presented as 184 versus 12 per 100,000, than as 0.184% versus 0.012%. (3) Avoids confusion with percent change. In the context of this paper, using "x per thousand" instead of "x percent" avoids confusion with "x percent change" or the awkwardness in spelling out the latter as "x percent change in the percent violent."

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